GENERAL ELECTRIC

NUCLEAR POWER

SYSTEMS DIVISION

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50-447

U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, DC 20555

Attention: Mr. C. H. Berlinger, Chief
Core Performance Branch

Gentlemen:

SUBJECT: GESSAR II REVIFW - NRC REQUEST FOR INFORMATION

The attached information is provided at the request of Mike Tokar. This information was discussed with him in our meetings of January 25 and 26, 1983, regarding our response to Question 490.01 on GESSAR II.

Very truly yours,

J. S. Charnley

J. S. Charnley
Fuel Licensing Manager
Nuclear Safety and Licensing Operation

JSC:hmm/D02087

Attachment

E003
Add: Mike Tokar

A.

ITEM	BASIS
Cladding Stress	The fuel rod cladding is evaluated to ensure that the fuel will not fail due to fuel cladding stresses exceeding the cladding mechanical capability.
Fatigue	The fuel rod cladding is evaluated to ensure that the fuel will not fail due to cyclic fuel rod loadings exceeding the cladding fatigue capability.
Fretting Wear	The fuel assembly is evaluated to ensure that the fuel will not fail due to fretting wear of the assembly components.
Crud, Oxide	The fuel rod is evaluated to ensure that the cladding temperature increase and cladding metal thinning due to cladding corrosion, and the cladding temperature increase due to the buildup of corrosion products, do not result in fuel rod failure due to reduced cladding strength.
Rod Bowing	The fuel rod is evaluated to ensure that fuel rod bowing does not result in fuel failure due to boiling transition.
Irradiation Growth	The fuel assembly is evaluated to ensure that irradiation-induced axial growth does not result in fuel failure due to insufficient axial expansion space.
Rod Pressure	The fuel rod is evaluated to ensure that the effects of fuel rod internal pressure will not result in fuel failure due to excessive cladding pressure loading.
Hydraulic Loads	The fuel assembly is evaluated to ensure that interference sufficient to prevent control blade insertion will not occur.
Control Rod Reactivity	The fuel system is evaluated to ensure that the reactivity control required to bring the reactor to cold shutdown is maintained.

B.

ITEM	BASIS
Hydriding	The fuel rod is evaluated to ensure that failure will not occur due to internal cladding hydriding.
Cladding Collapse	The fuel rod is evaluated to ensure that fuel rod failure due to cladding collapse into a fuel column axial gap will not occur.
Fretting	-----
Cladding Overheating	The fuel rod is evaluated to ensure that fuel rod failure due to boiling transition cladding overheating will not occur.
Fuel Pellet Overheating	The fuel rod is evaluated to ensure that fuel rod failure due to excessive fuel melting will not occur during steady-state operation.
Fuel Enthalpy	Fuel rod failure during severe reactivity initiated accidents is evaluated to ensure no underestimation of the number of fuel rod failures.
Pellet-Clad Interaction	The fuel rods are evaluated to ensure fuel rod failure due to pellet-clad mechanical interaction excluding internal environmental effects will not occur during anticipated operational transients.
Bursting	The fuel assembly is evaluated in compliance with the requirements of 10 CFR 50 Appendix K as it relates to the incidence of rupture during a LOCA.
Mechanical Fracturing	The fuel rod is evaluated to ensure that mechanical fracturing will not occur as a result of hydraulic loads or a load derived from core-plate motion.

C.

ITEM	BASIS
Clad Embrittlement	The fuel assembly is evaluated in compliance with 10 CFR 50.46 as it relates to cladding embrittlement during a LOCA.
Violent Expulsion of Fuel	Severe reactivity initiated accidents are evaluated to ensure that widespread fragmentation and dispersal of the fuel will not occur.
Clad Melting	See Clad Embrittlement.
Fuel Rod Ballooning	The fuel assembly is evaluated in compliance with 10 CFR 50 Appendix K as it relates to the degree of fuel cladding swelling and rupture during a LOCA.
Structural Deformation	The fuel assembly is evaluated under SSE and LOCA loading conditions to ensure that loss of fuel assembly coolability,and interference to the degree that control blade insertion is prevented, will not occur.